Sylvia's Top 5 "Musts" in Plan Reading and Analysis

Educational Workshop
For Land Use Board Volunteers
and Planners

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Town of Exeter, New Hampshire

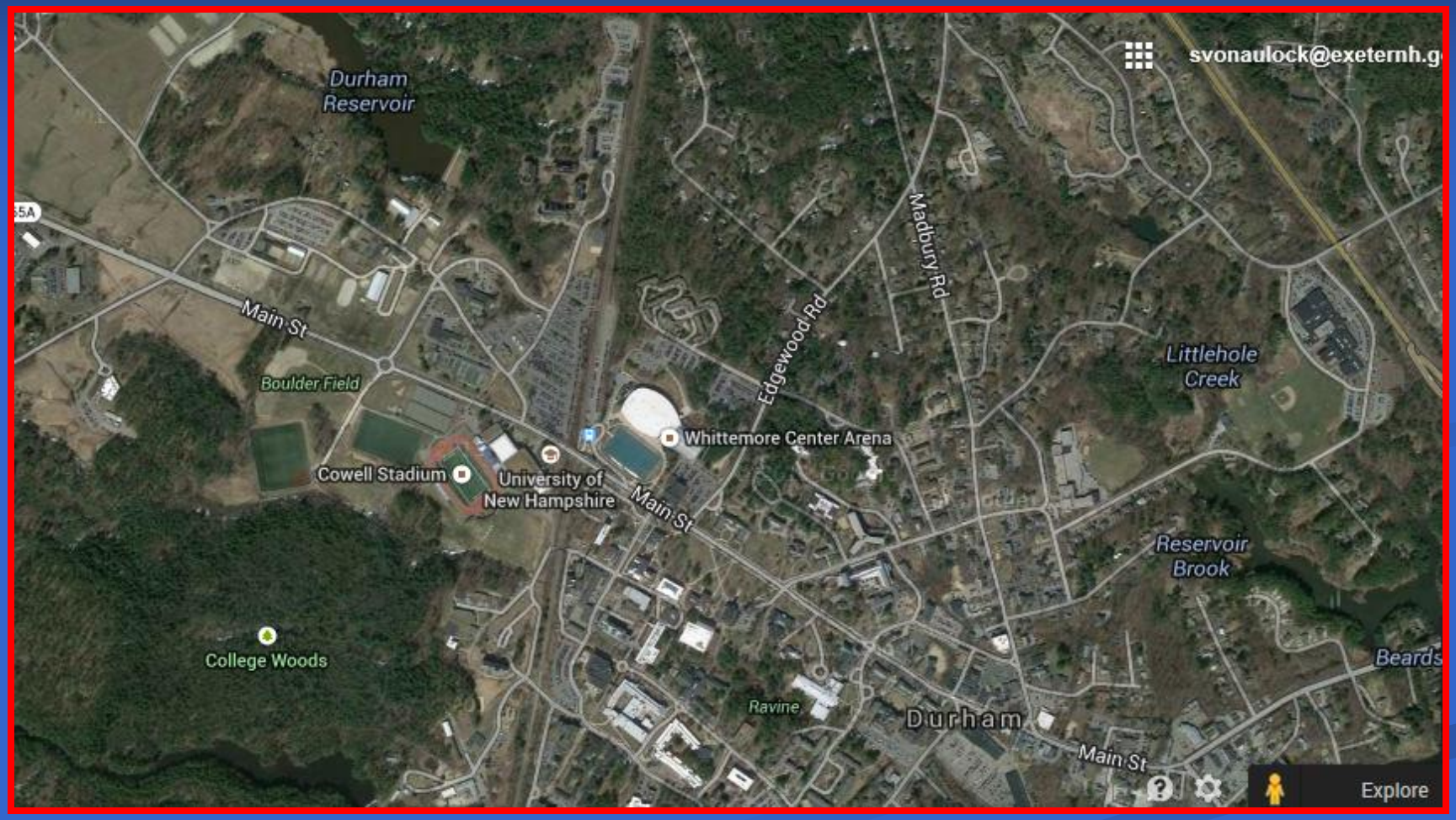
Sylvia's Five "Musts" in Plan Reading and Analysis

1. Understand that a 2 dim. plan depicts a 3 dim. world.
2. Learn engineering terms and graphic symbols.
3. Color your plans to better understand them.
4. Understand all plan elements to ensure you can make sound judgments.
5. Utilize staff and consulting experts to discuss concerns and red flags. (Ask questions, demand answers.)

Top 5 “Musts” in Plan Review and Analysis

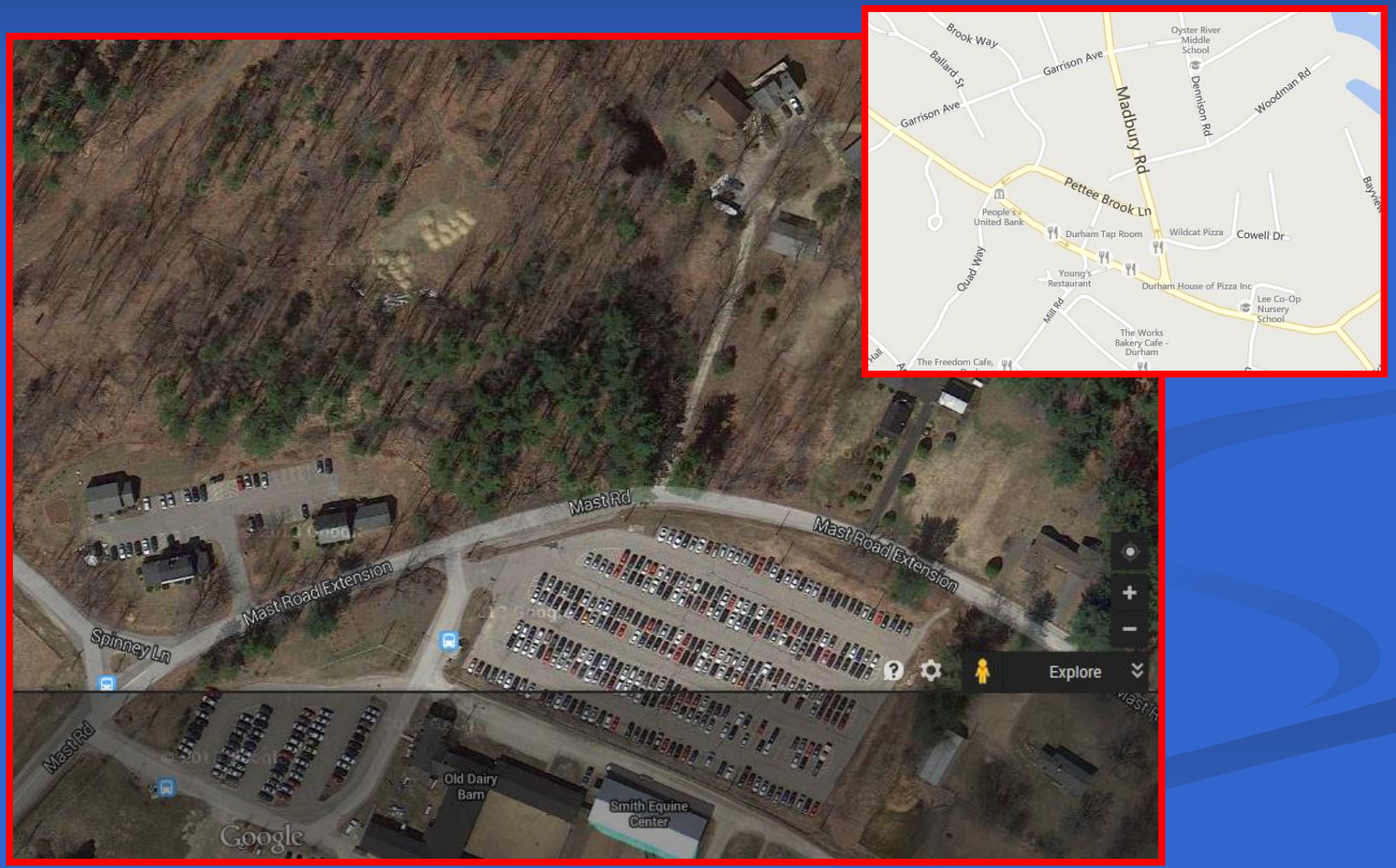
1) Understand that a two dimensional plan depicts a three dimensional world. Know the area that will be impacted so you can better visualize to project and its impact. If you can, VISIT THE SITE!

Web & Getting to Know a Site

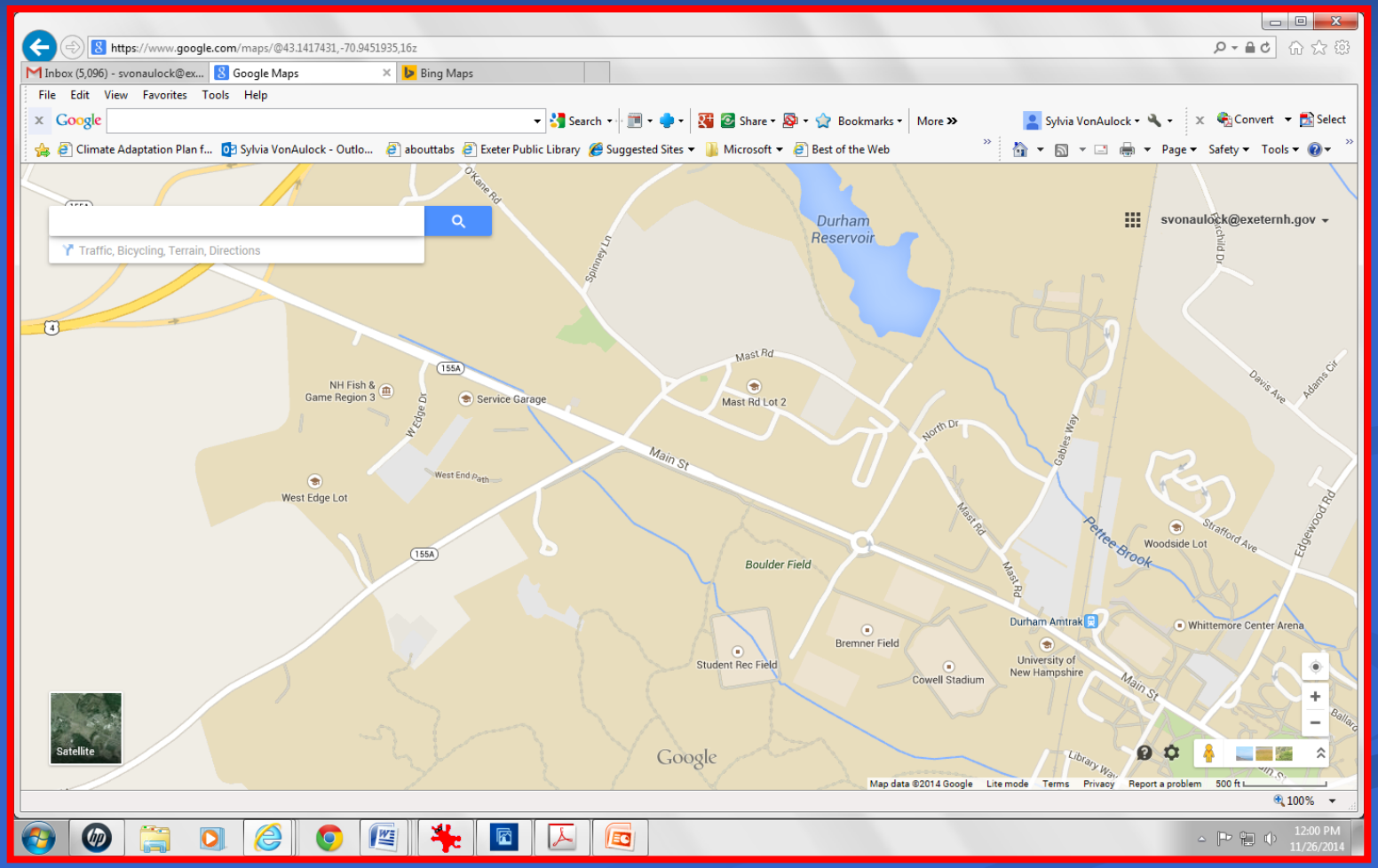


Courtesy of Google Maps or Bing.com

What Information Is Provided During Site Plan Review?



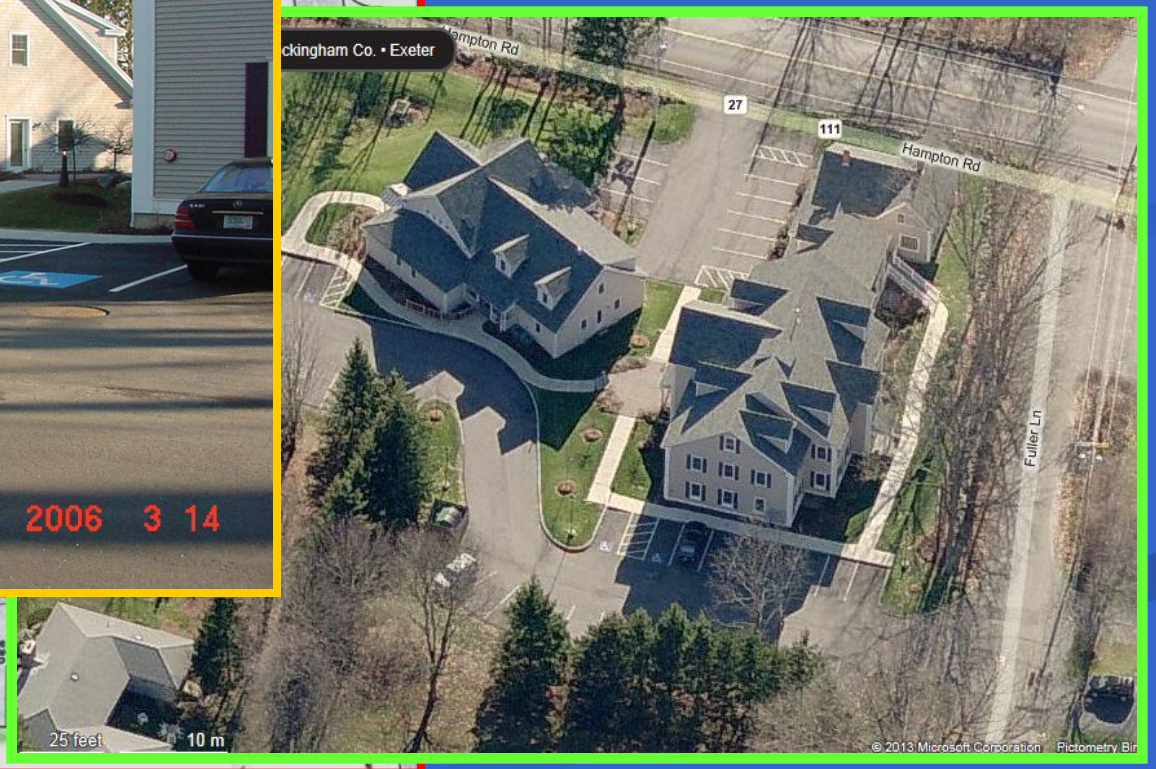
Take 60 seconds to learn about a site!



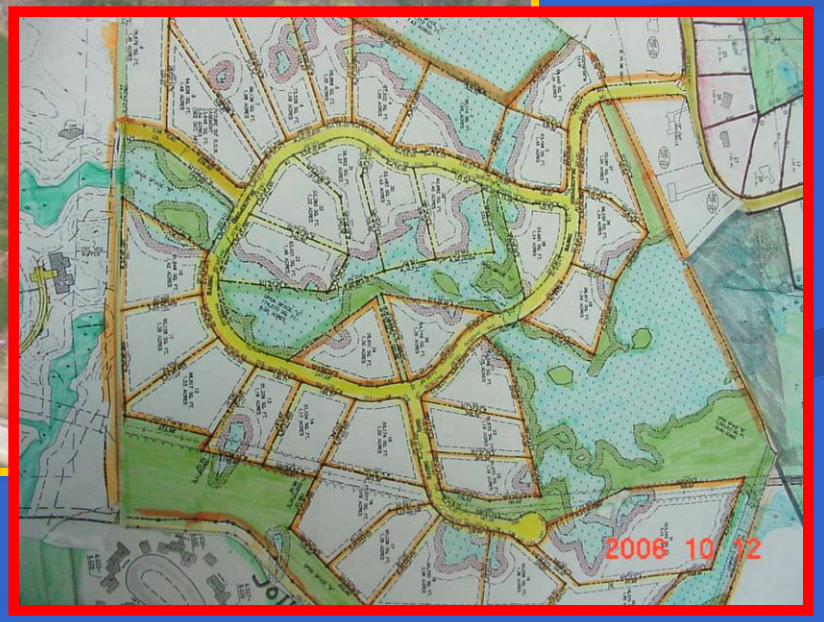
Bird's Eye View & Concept of Scale

Do You Have All The Information ?

Reading Two Dimensional Plans in a Three D. World



Practice Visualizing What the Bird's Eye View May Look Like.



Remember the Context of the Three Dimensional World

CHECK LIST OF POTENTIAL ISSUES:

- Traffic Circulation
- Pedestrian Saftey
- Access Points
- Storm Water
- Water/Waste Water
- Landscape/Lighting
- Compatibility
- Within the Goals of the Master Plan

Top 5 “Musts” in Plan Review and Analysis

1) Understand that a two dimensional plan depicts a three dimensional world.

Suggestion: Ask developer for an aerial view of site, schedule site visit.

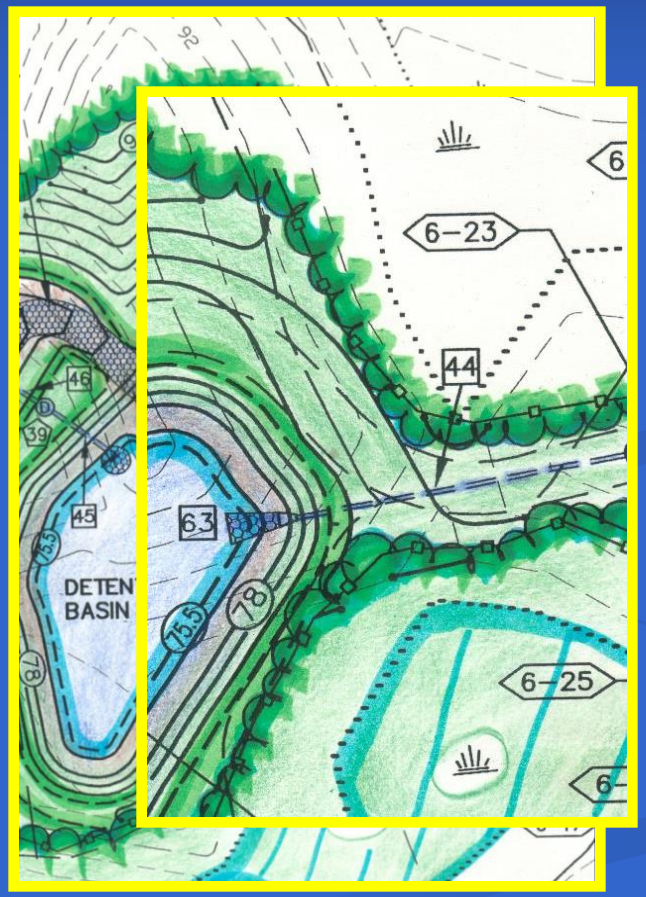
Top 5 “Musts” in Plan Review and Analysis

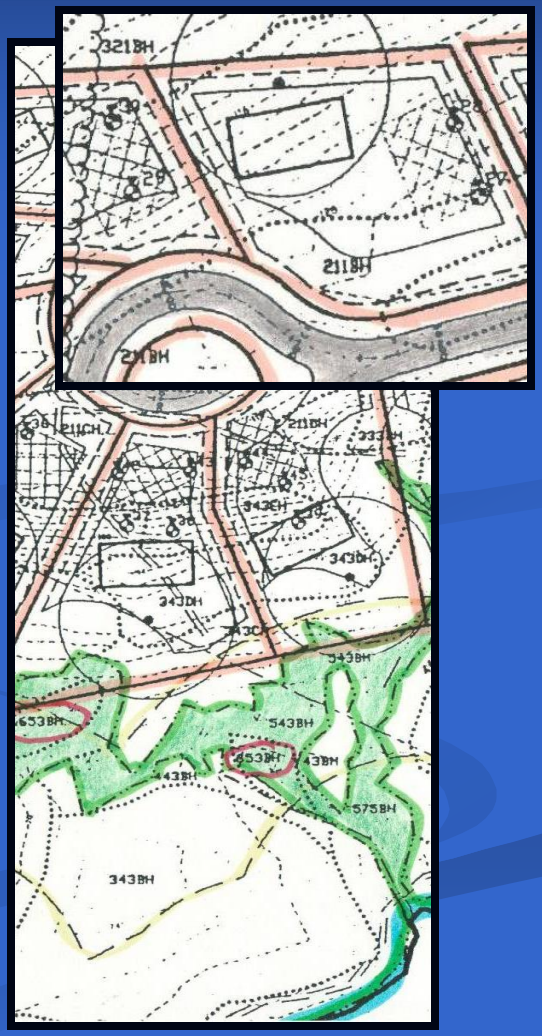
1. Understand that a 2 dimensional plan depicts a 3 dimensional world.
2. **Learn engineering terms, graphic symbols and plan types.**

Engineering Terms

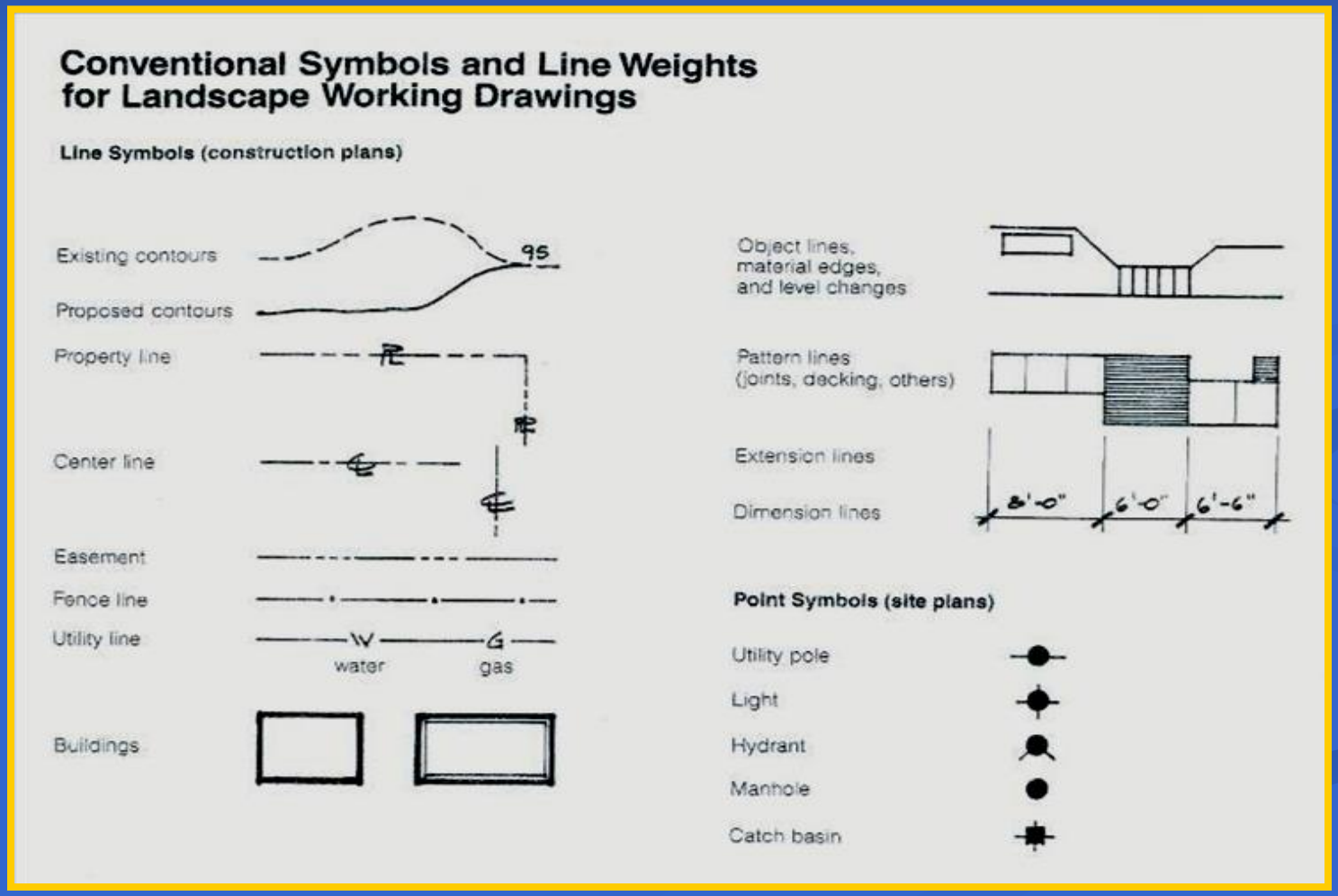
- Locus Map, Existing Conditions
- Contour Lines, Percent Grade, Topography, Spot Grades,
- Cross Section, Road Profile, Road Centerline, Cut & Fill
- Detention Pond, HISS Map, Swale, Culvert, Rain Garden, Headwall, Rip-Rap
- Construction Sequence, Erosion and Sediment Control

What Do All The Lines Mean

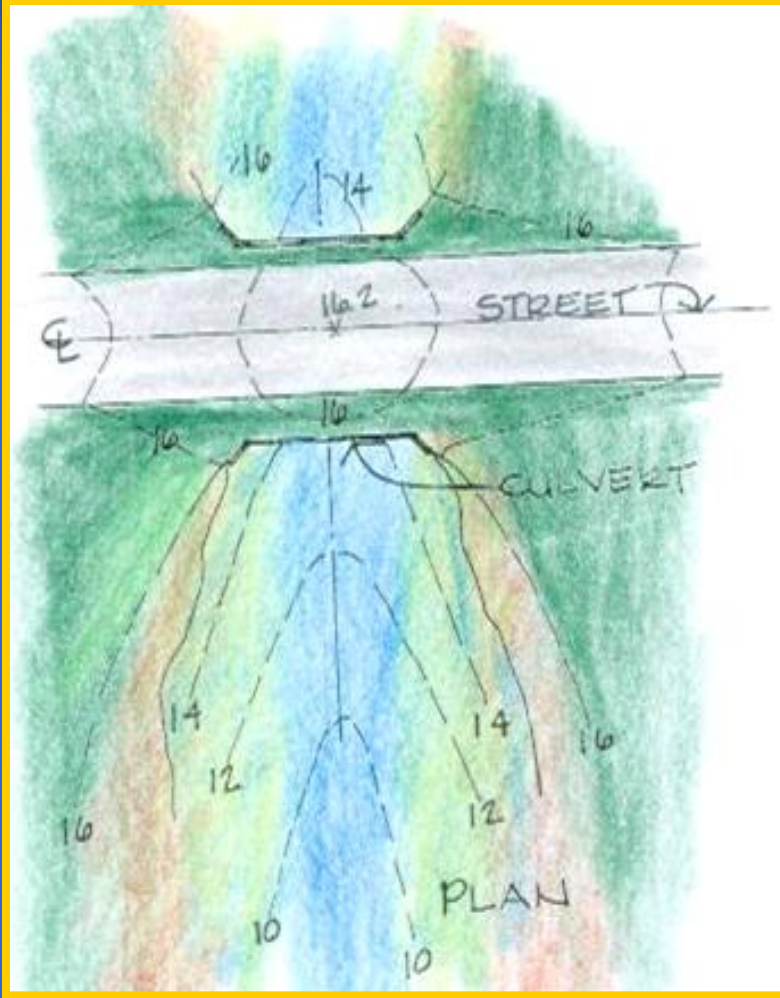




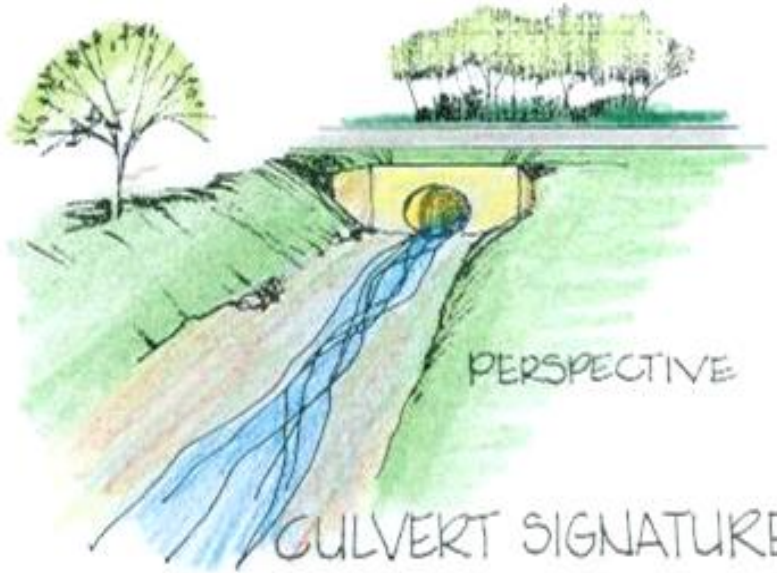
The Legend and Graphic Symbols



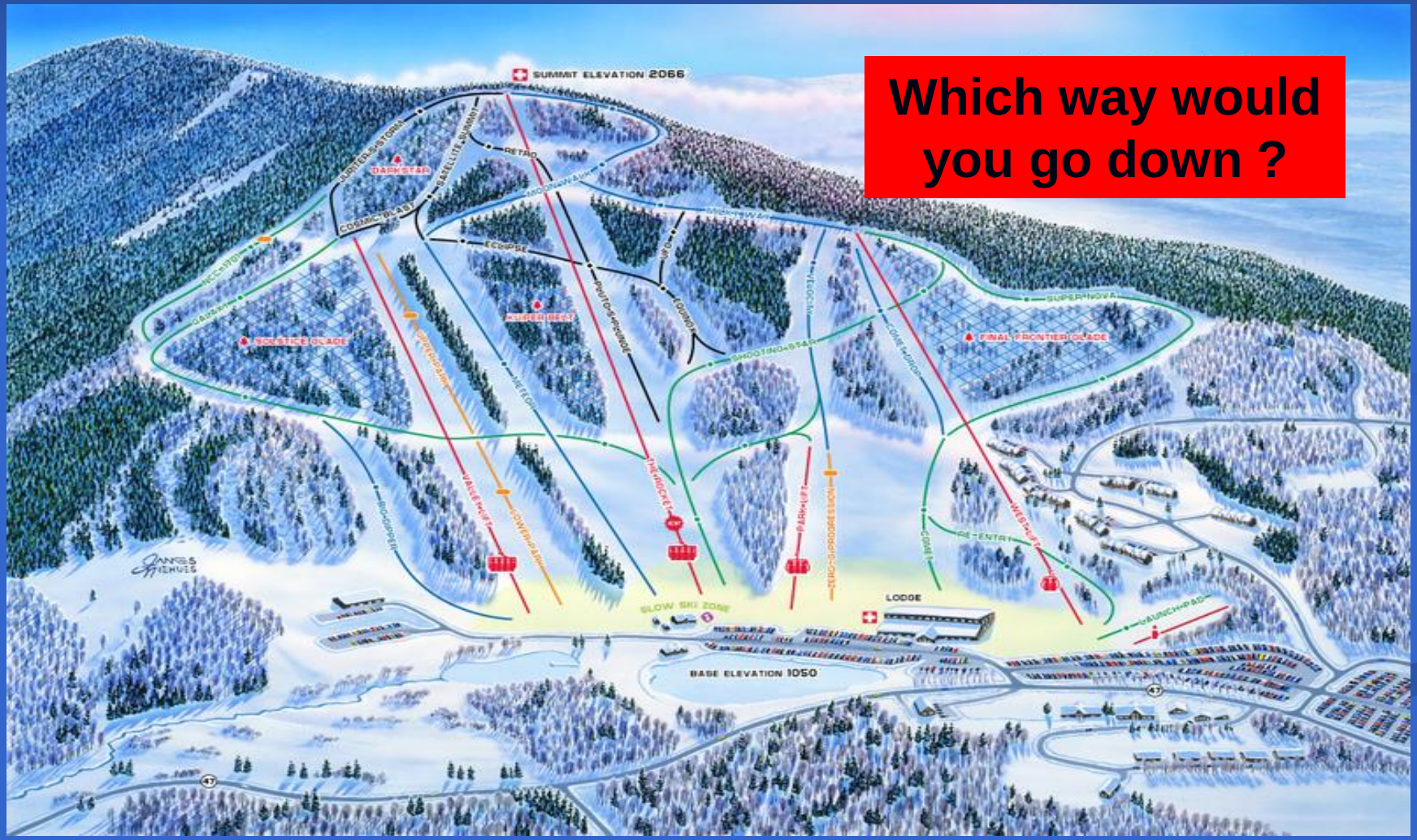
Familiarize Yourself With Various Types of Plans and Perspectives



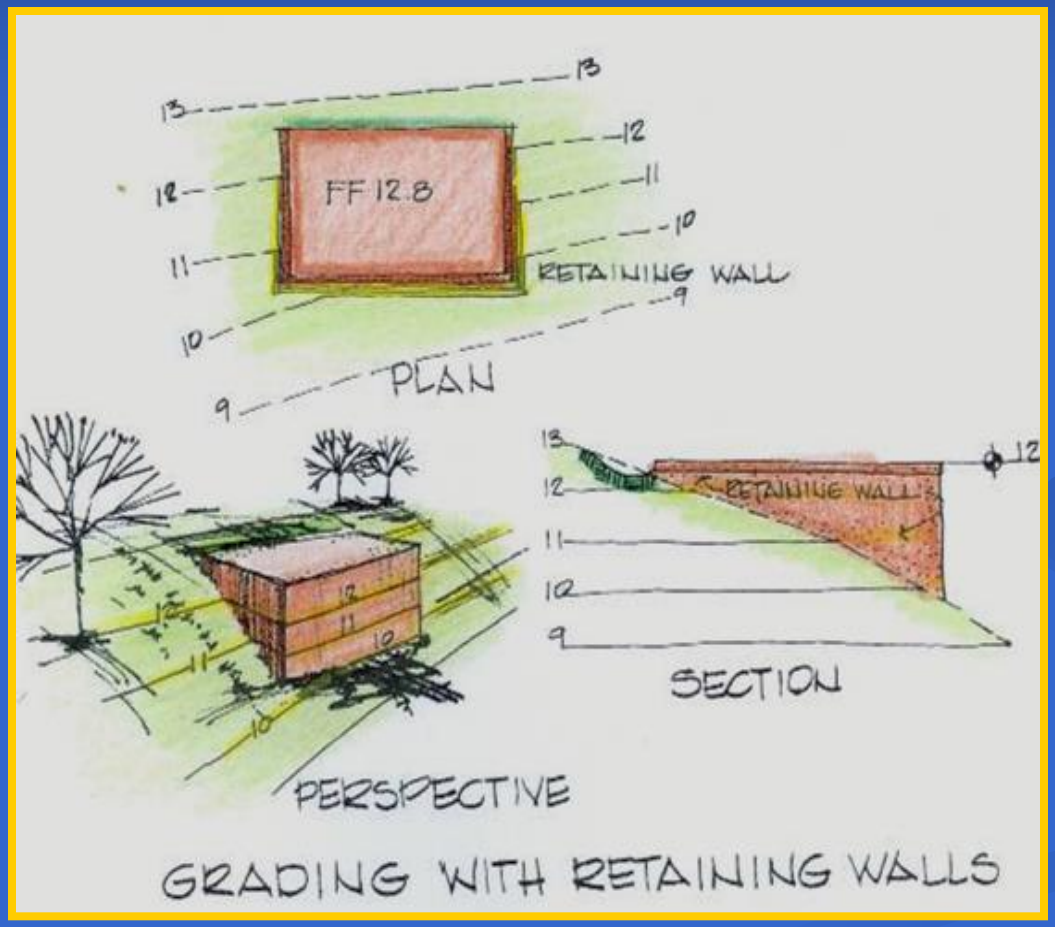
- Bird's Eye View
- Plan Perspective



Slopes- You know more than you think you know



Learning to Read Contour Lines



- Contour lines represent a specific elevation typically above sea level
- The elevation along the line remains constant, therefore, contour lines never cross.

Grading Basics

The steepness of a surface is generally measured in % grade (slope) and is the ratio of the elevation change per the horizontal distance traveled.

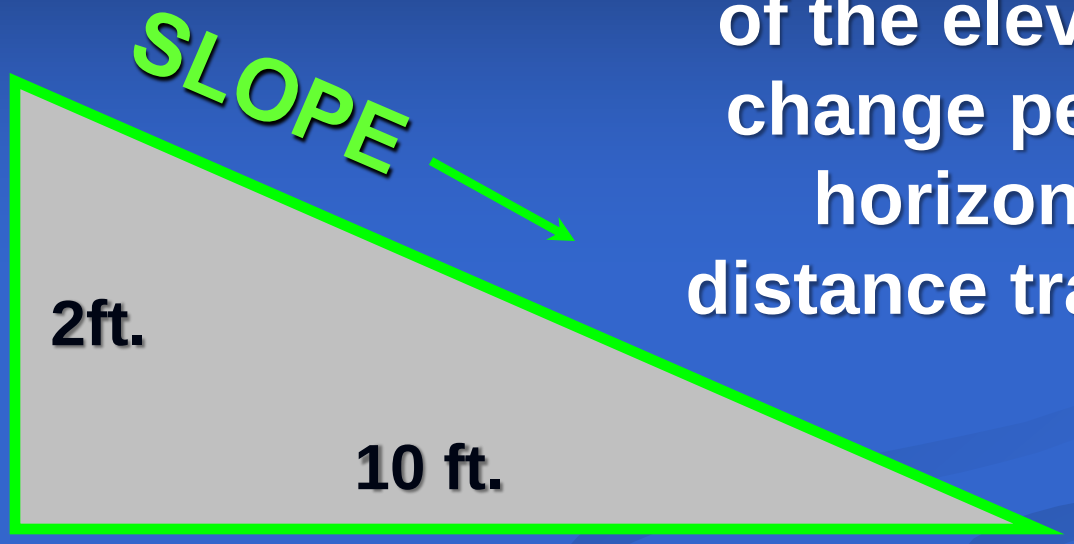
Questions to Ask:

1. How steep is it?
2. Will the slope cause problems?
3. What about runoff?

Slope Equation

Slope is the ratio of the elevation change per the horizontal distance traveled

Rise
(height difference between contours)



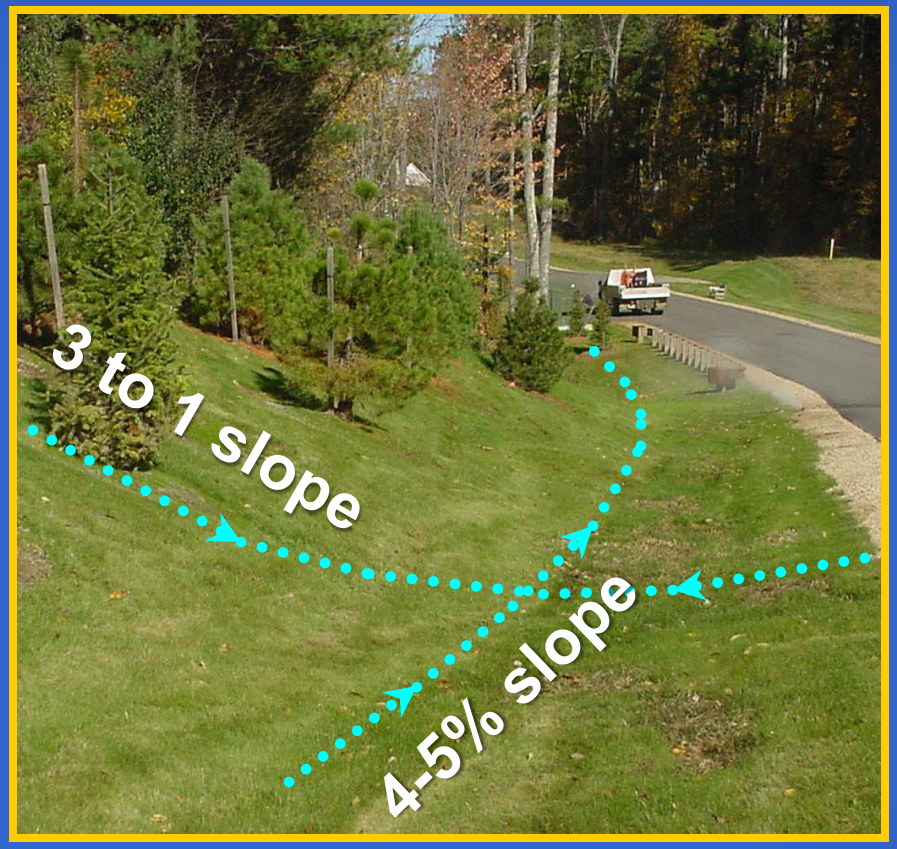
Run (Distance between contours)

Rise/Run = Slope or % grade

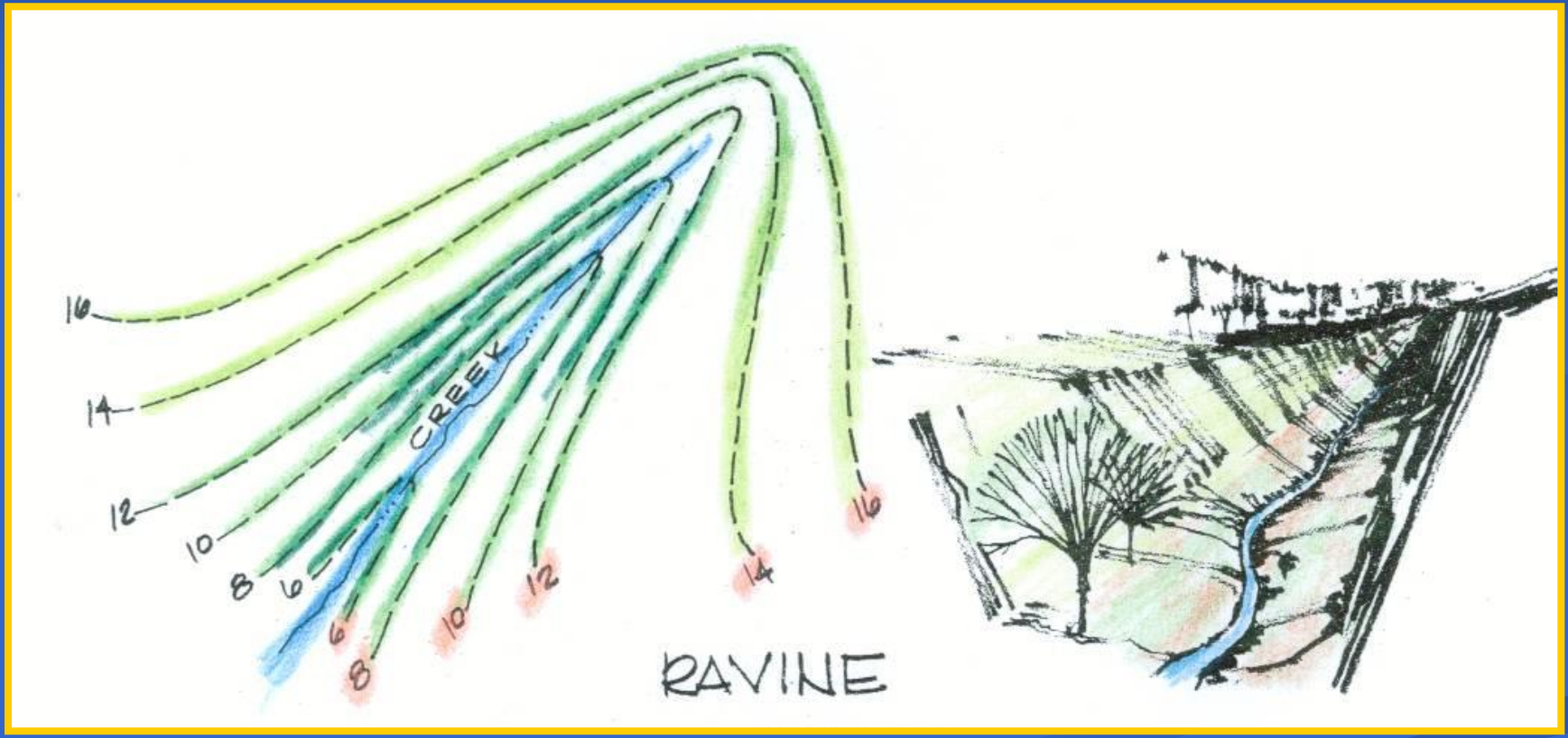
Ex: 2 ft/10 ft = .2 or 20 % slope

Grading, Drainage and Percent Slopes

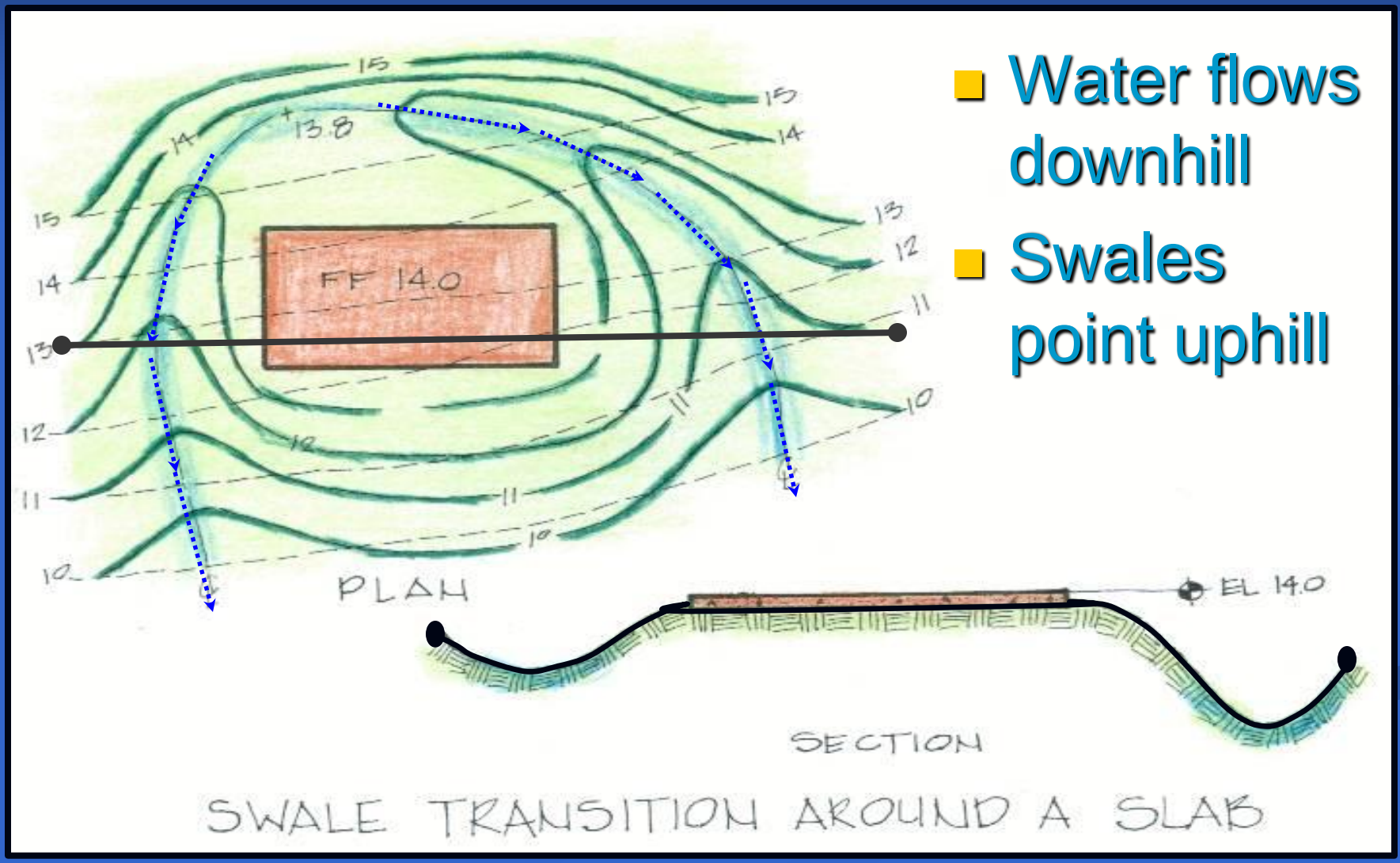
Slope Ratios, Percent Grade or Slopes



Recognizing Contour Signatures



Contour Signature for Swale & Cross Sectional View



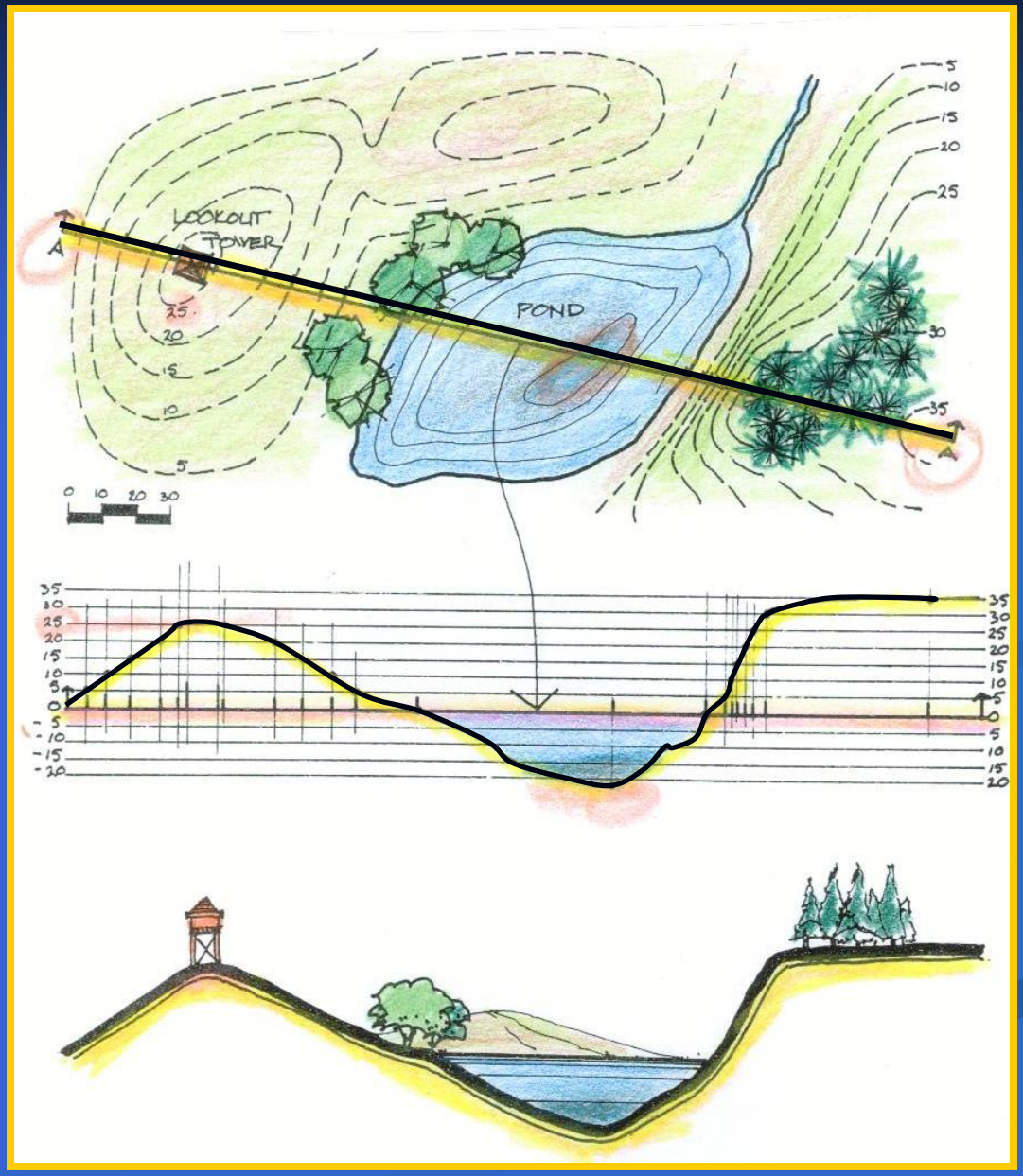
- Water flows downhill
- Swales point uphill

Cross Section

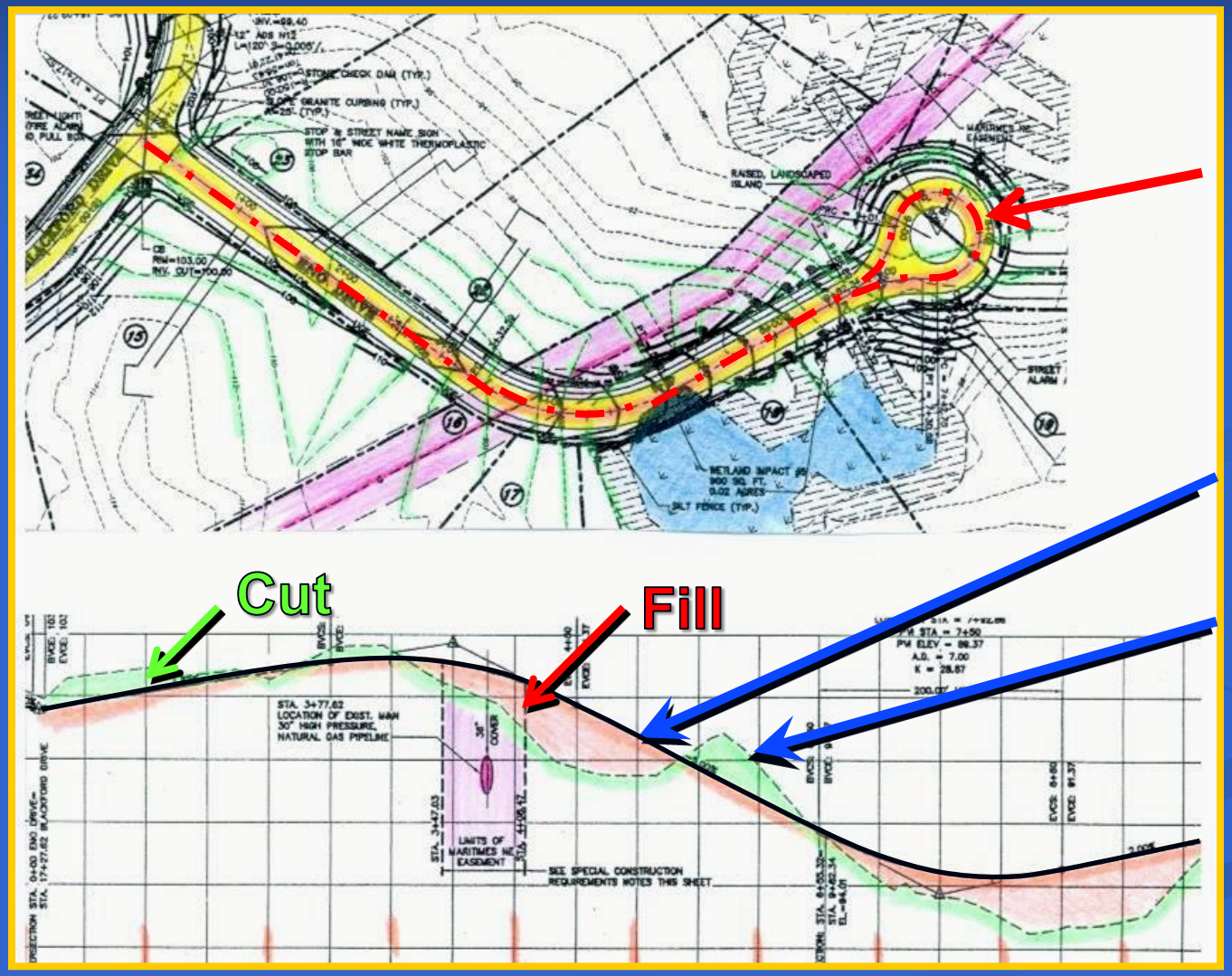
Allows you to see elevation changes as if you cut through the desired section

Cross Section

A graphical representation of a vertical section of a portion of the plan, cut at a right angle through the desired area.



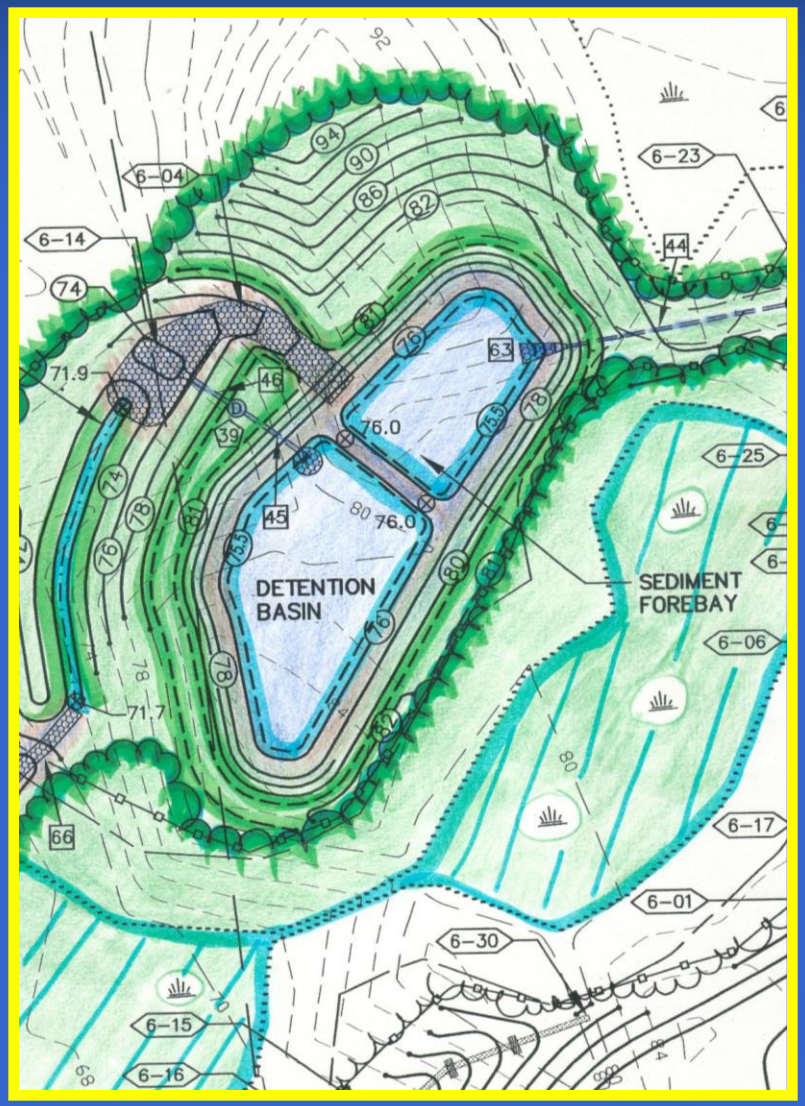
Road Profiles: Road Center line, Existing vs. Proposed Contours, Cut & Fill



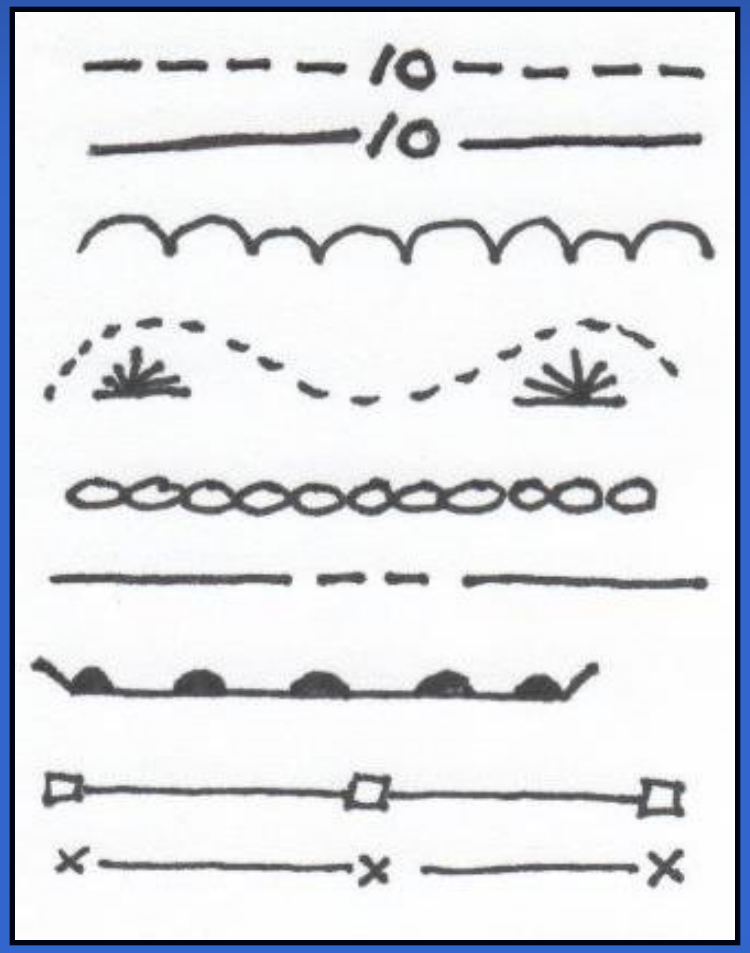
Roadway Centerline

- Solid Line = Proposed
- Dashed Line = Existing

Drainage Elements: Detention Pond, Forebay, Spillway, Culvert, Swale…



Pop Quiz: Identify The Symbol



Legend:

- Existing Contour
- Proposed Contour
- Tree line
- Edge of Wetlands
- Rock Wall
- Property Line
- Guard Rail
- Silt Fence
- Fence Line

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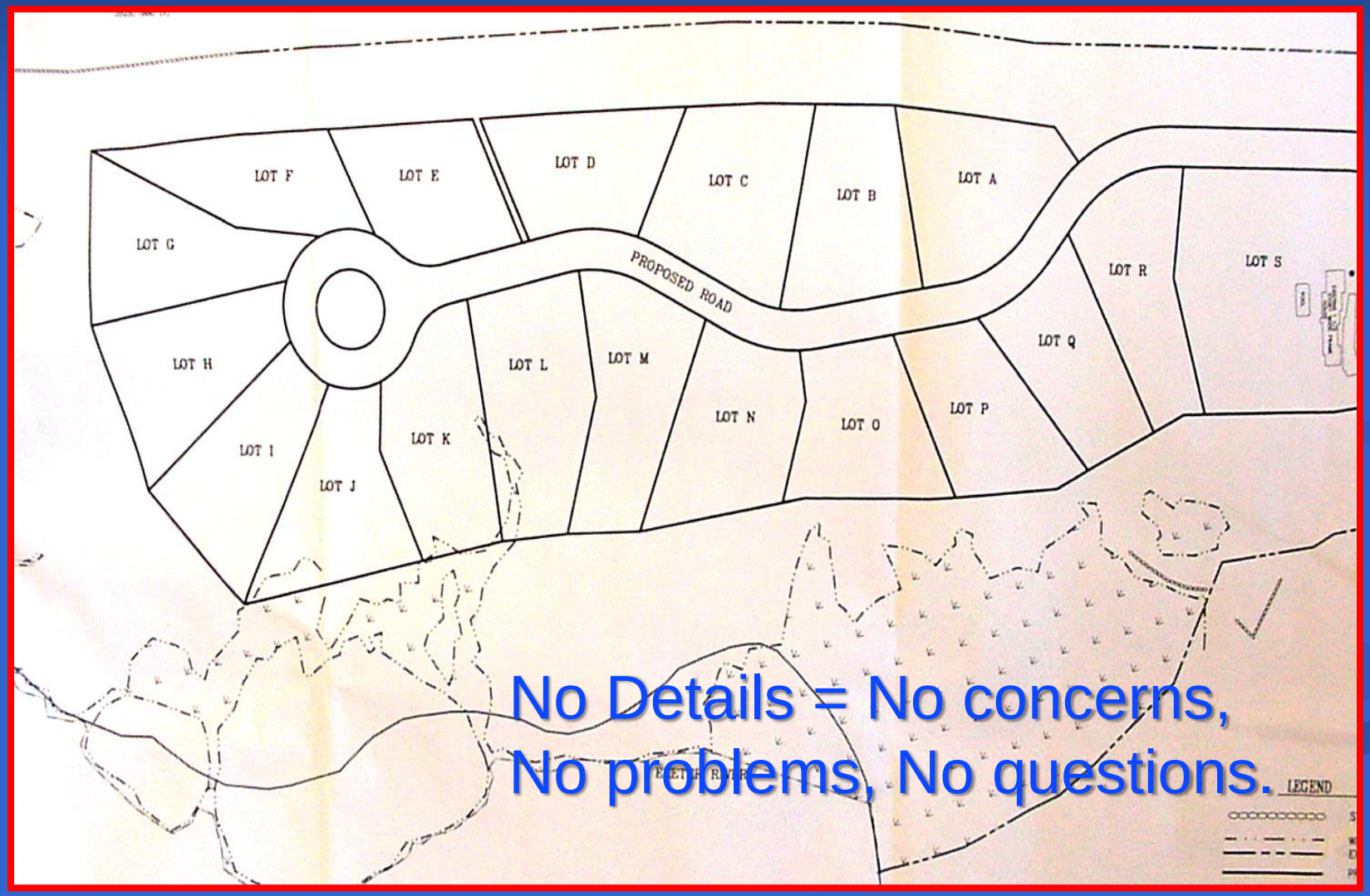
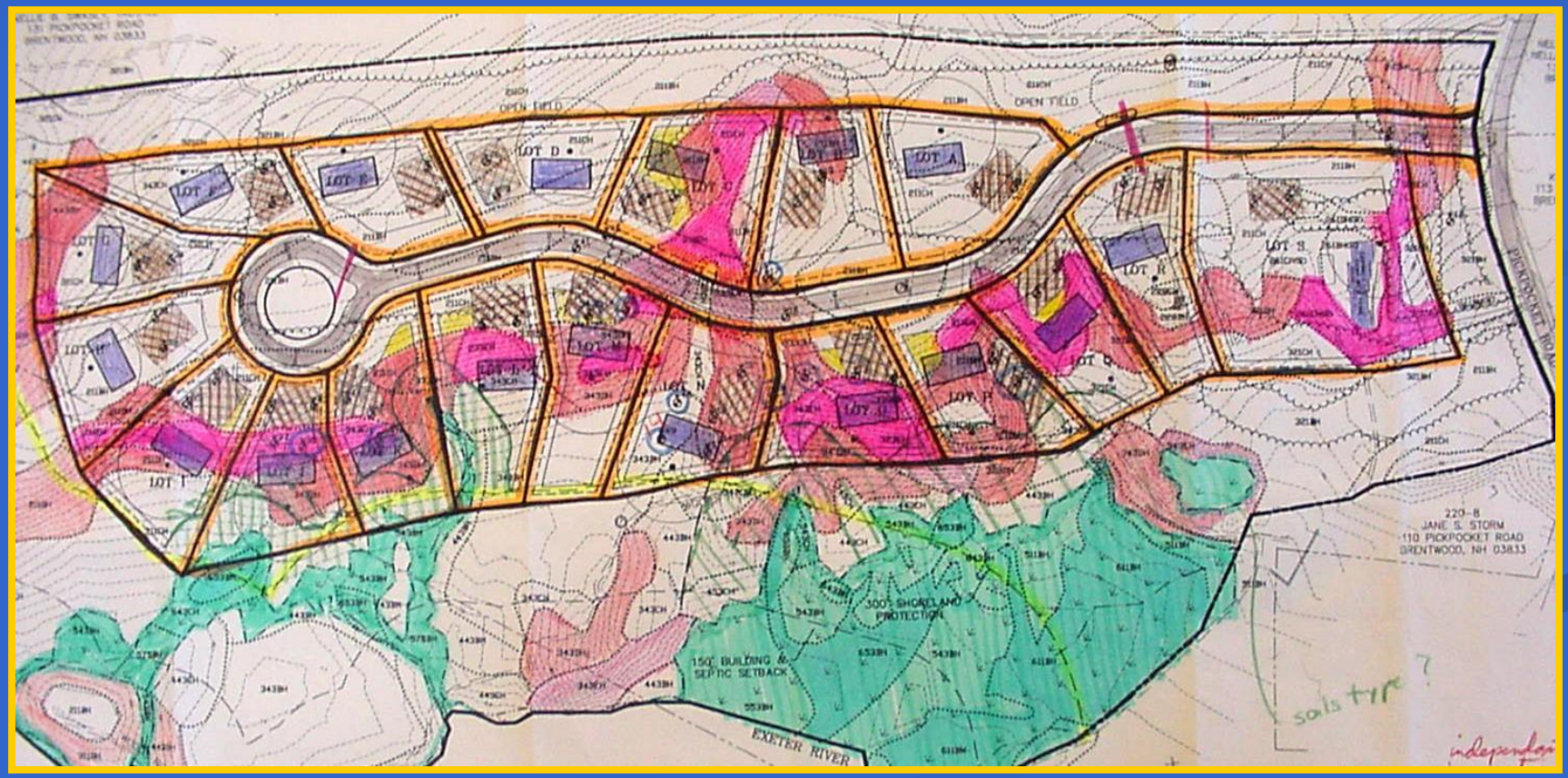
What the Developer Might Portray



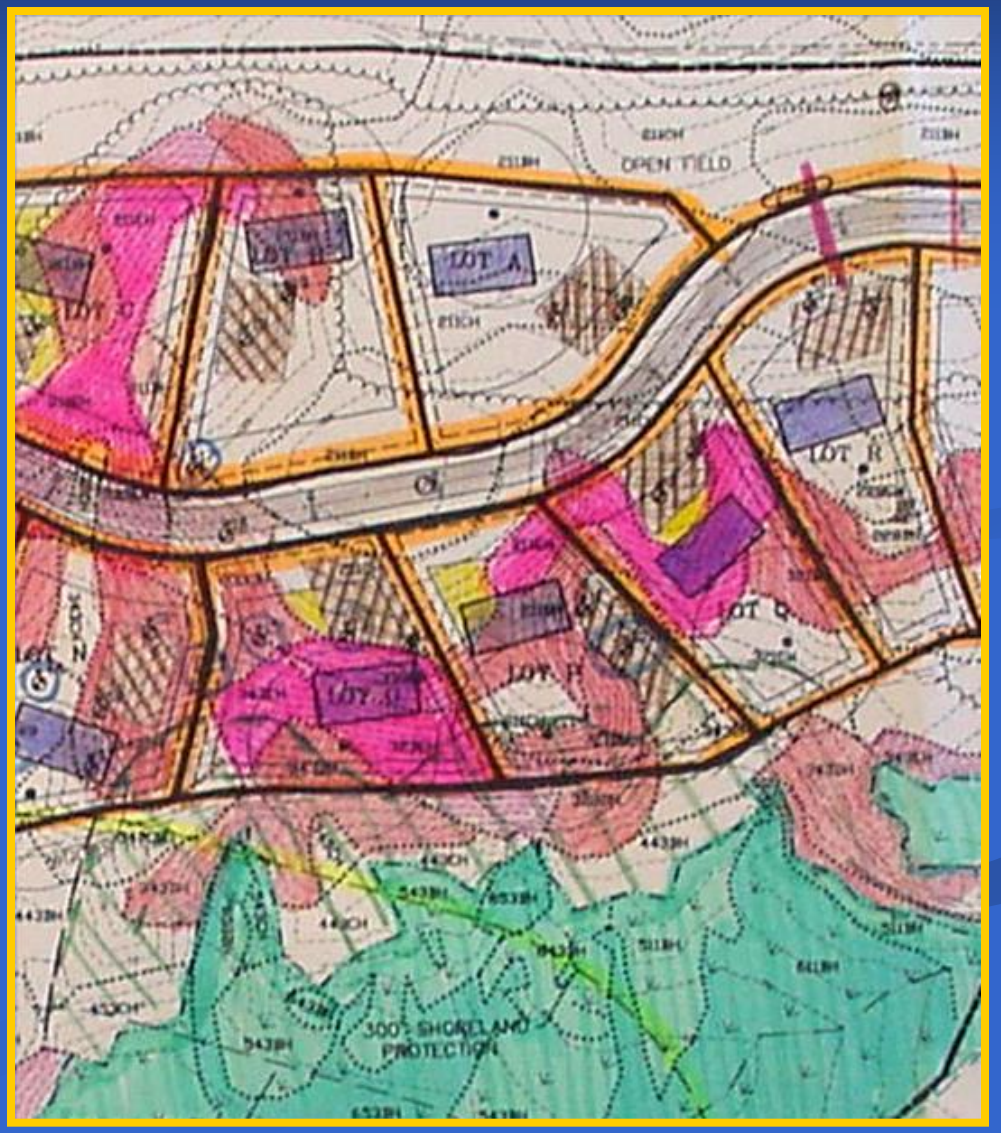
What is Hidden Between the Lines

- Color Aids the Reviewer in Site Analysis
- Demonstrates Issues to Planning Board
- Creates Negotiating Tool

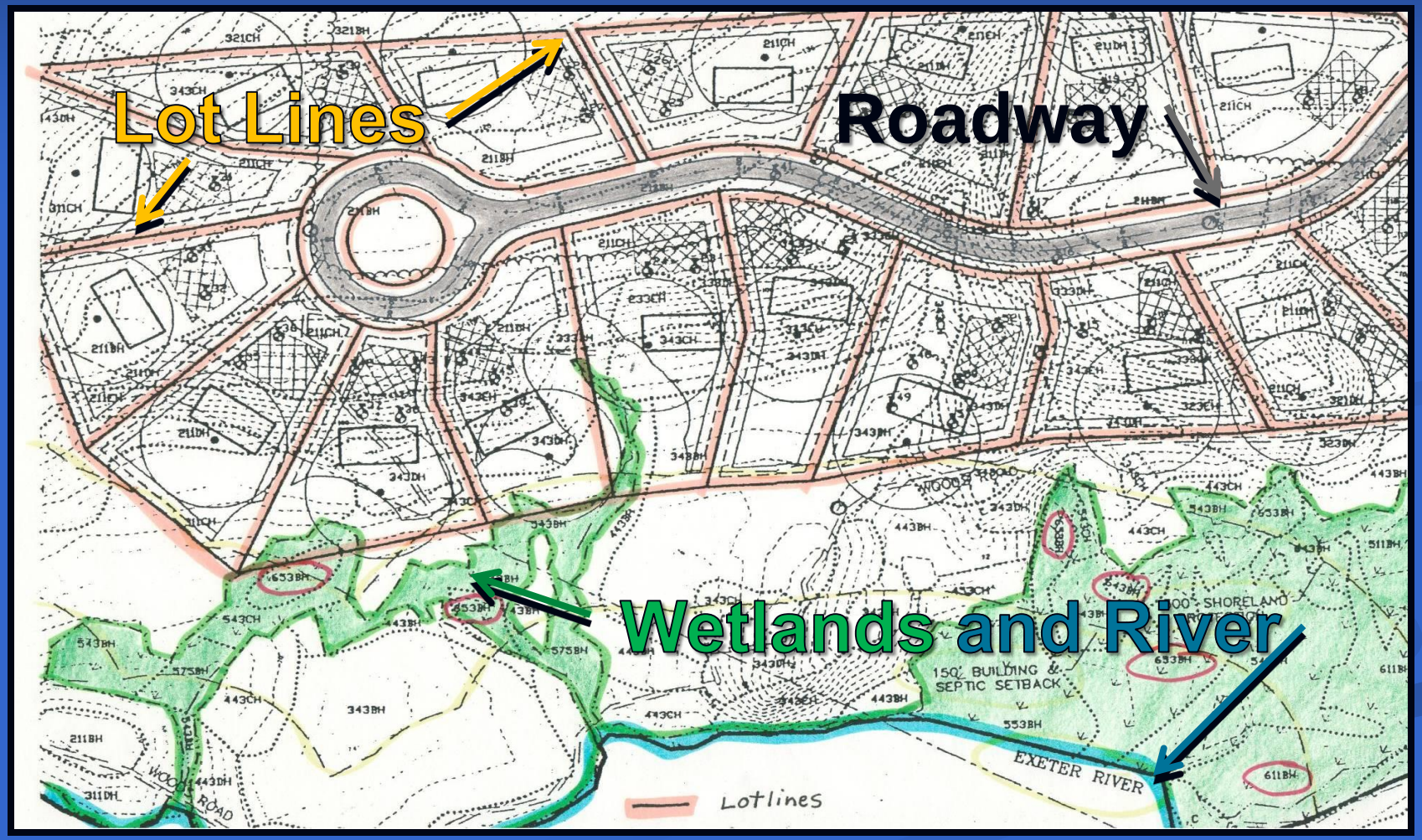


Graphically Outline the Issues

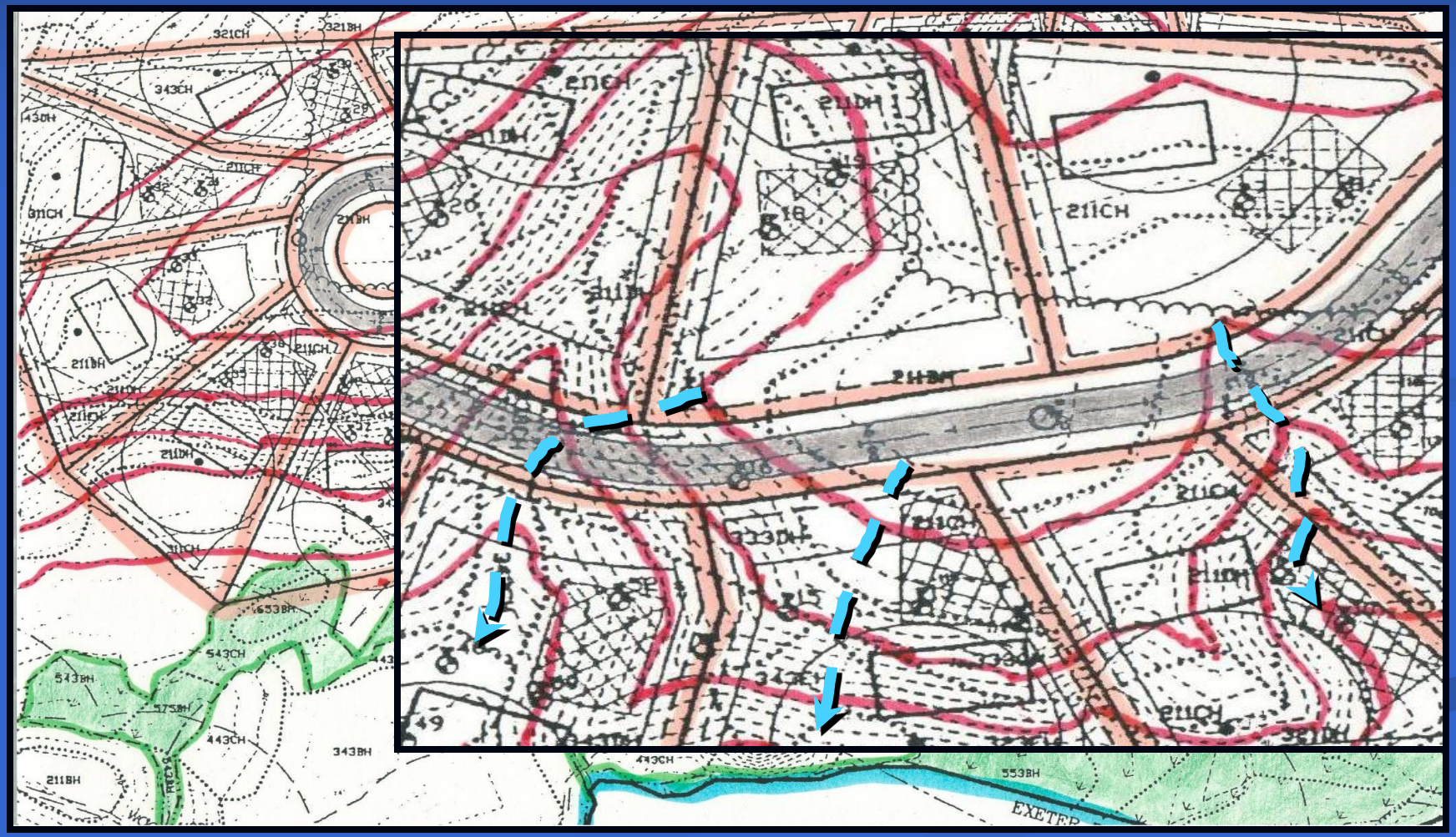
- Road Circulation
- Lot Lines
- Natural Characteristics: Steep Slopes, Wetlands
- Drainage and Grading ⇨ Erosion
- Proposed Building & Septic Systems



Bring the plan to life by first coloring in lot lines, roadways, and natural features.



Examine the topography to get an understanding of drainage.



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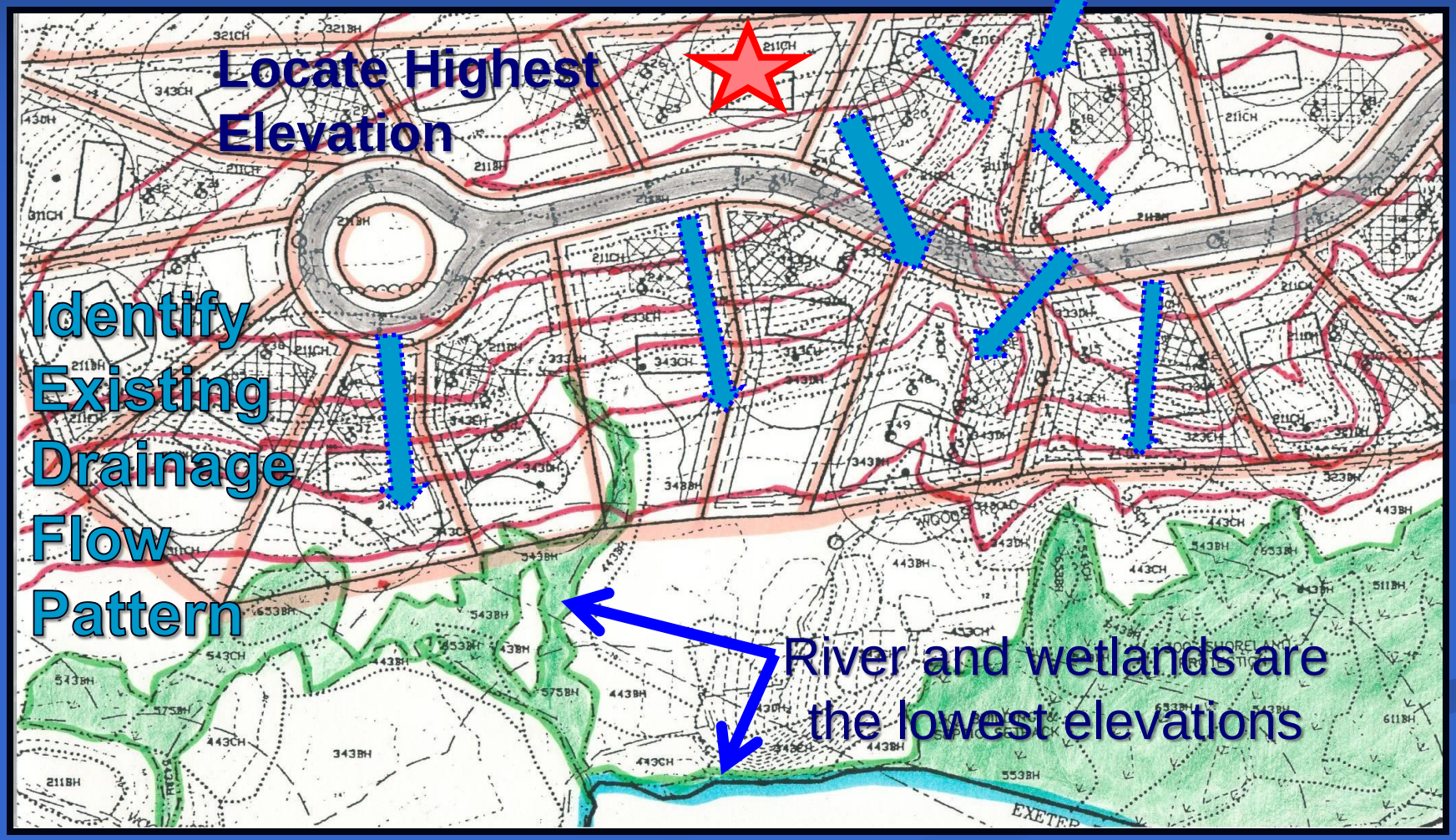
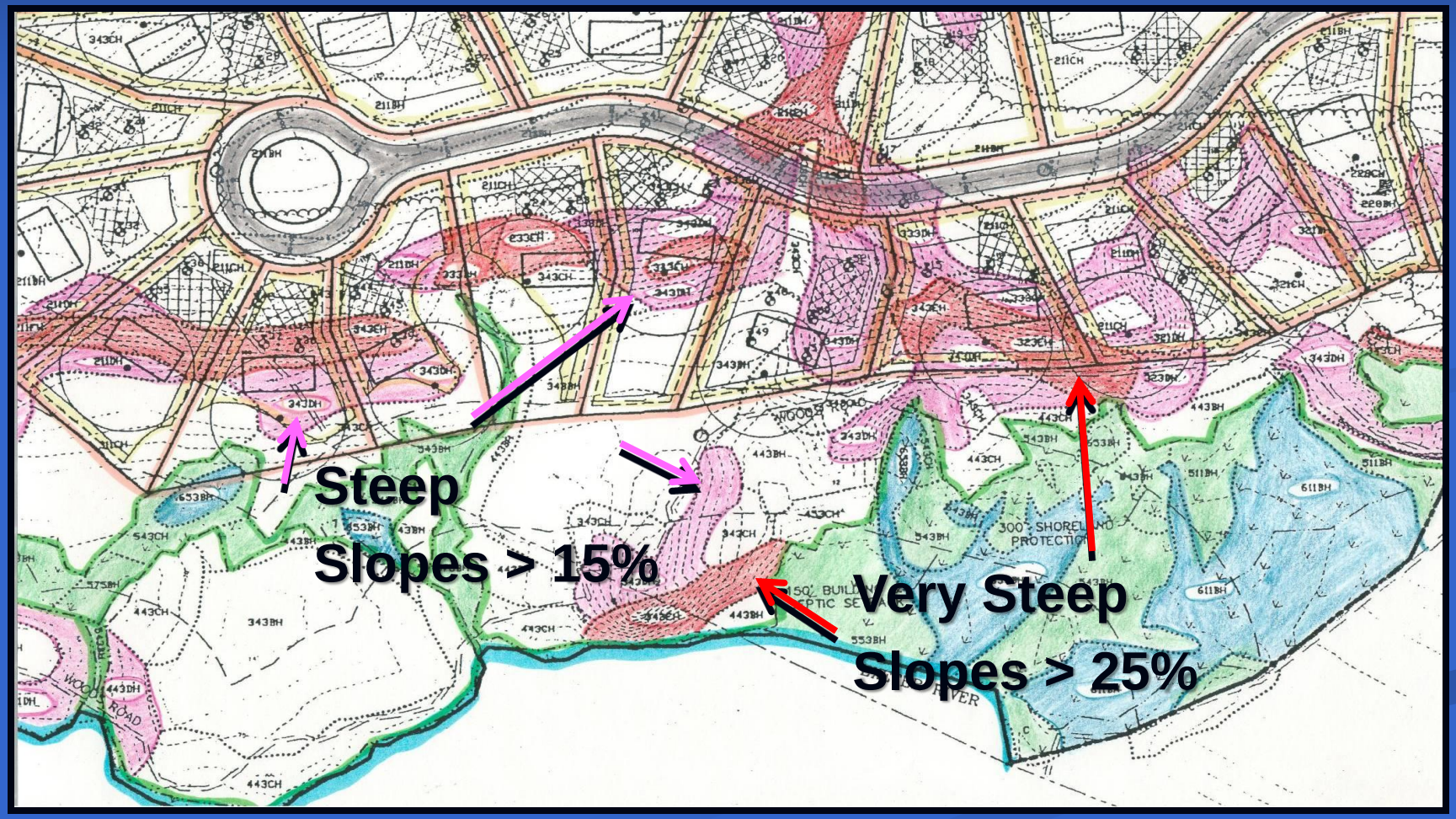
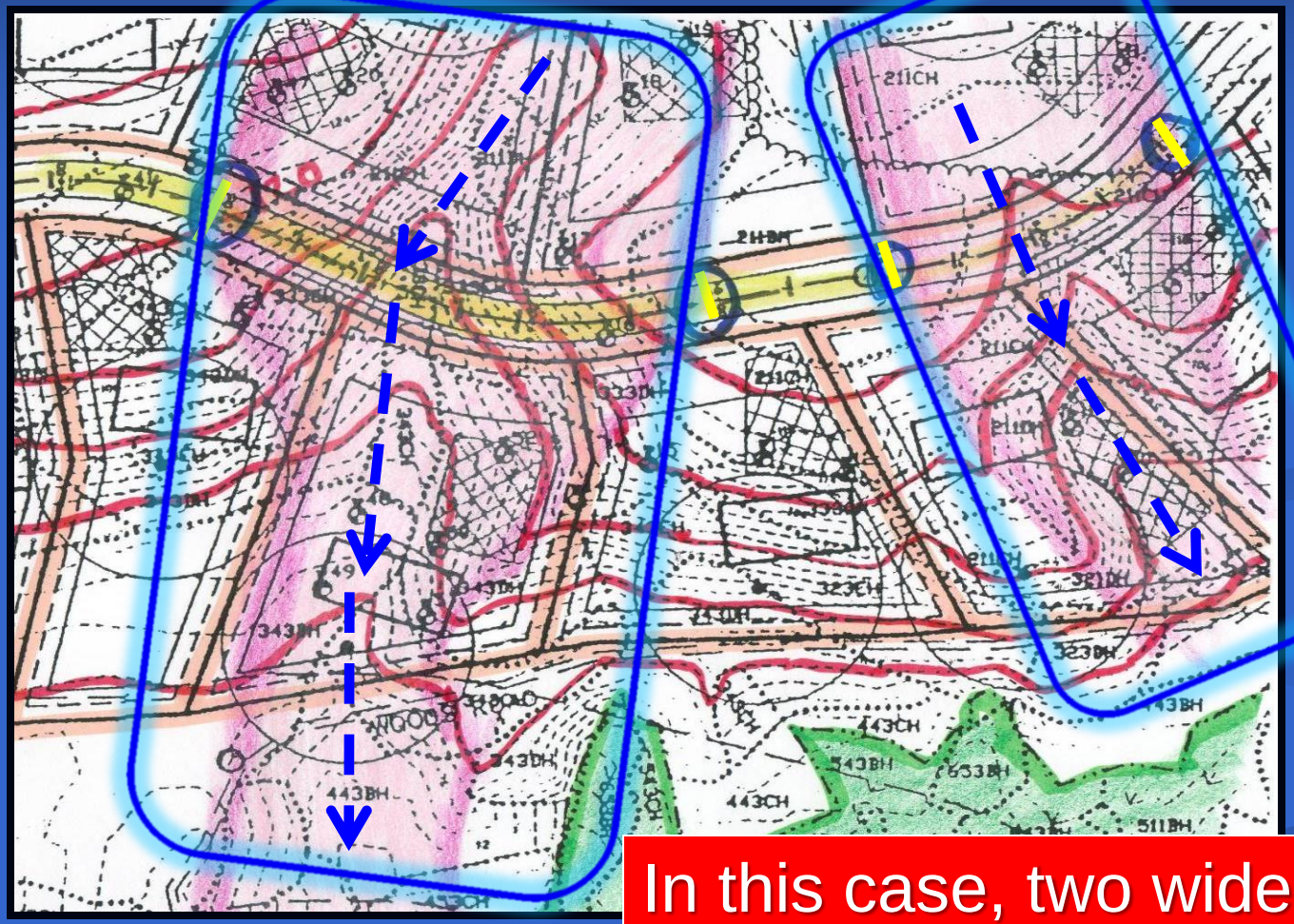


Highlight steep slopes utilizing available soils information.

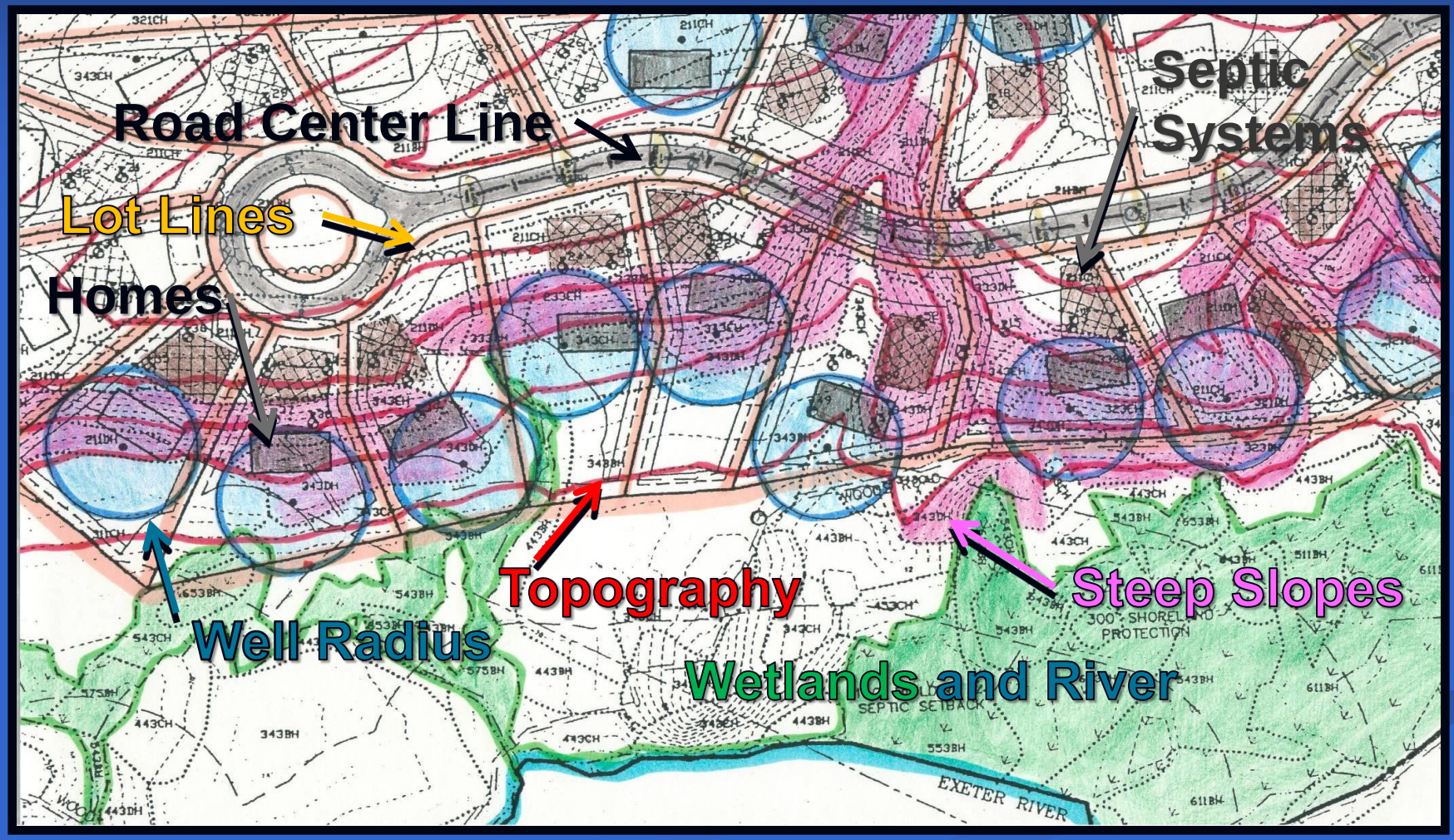


Identify Problem Areas



In this case, two wide, steep ravines are identified

Now analyze the plan with all the information.



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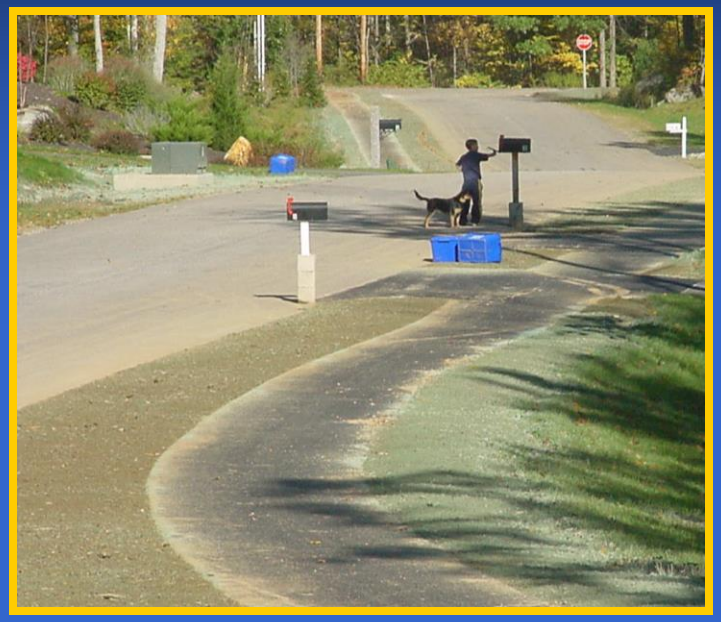
In order to understand plan details; visit sites before, during, and after construction.

Boundary Pins, Flagging and Stakes

Underground Utilities

- Electrical
- Telephone & Cable
- Gas
- Water
- Sewer
- Fire Cistern
- Drainage
- Irrigation

Sidewalks and Curbing



Construction Sites and Erosion Control

You can never have too much erosion control.

Depending on the type of soil, once suspended by rainwater, soil may always be in suspension.

DRAINAGE SYSTEMS

Sheet flow over gravel

Grass-lined swale and culvert

Culvert headwall with riprap channel

Detention Ponds

Forebay, Spillway, Headwall, Outlet Structure, Rip-rap

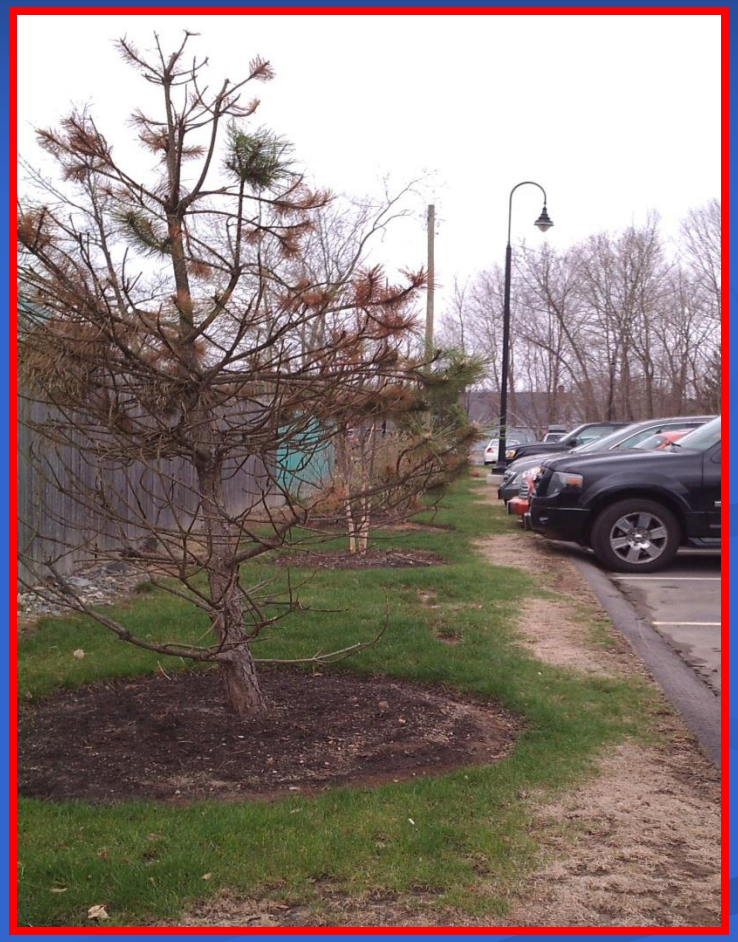
Underground Systems

Big Culverts, Little Bridges & Dams

Box culverts, bottomless culverts, wildlife friendly, fish passage friendly culverts…

Snow Removal

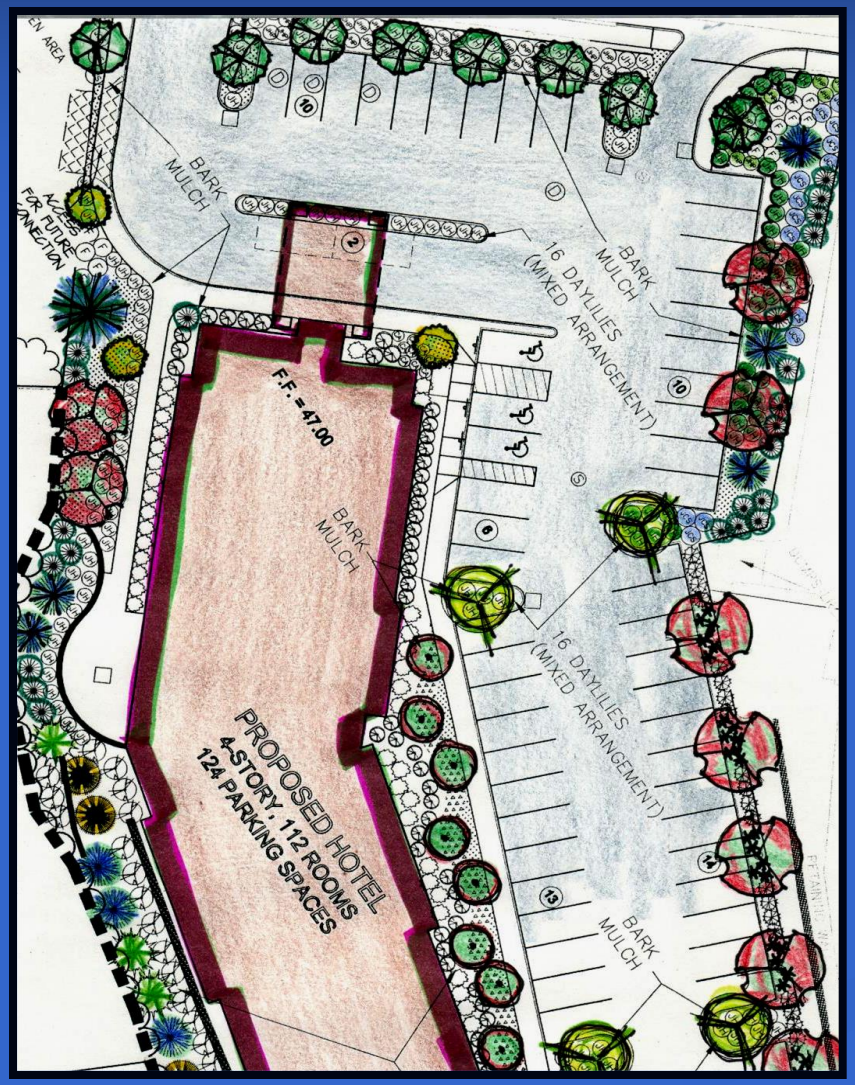
Plow and Salt Damage



LANDSCAPING ESSENTIALS:

- Planting Requirements
- Planting Schedule
- What to Plant
- Other Details

Planting Schedule and Plan



LANDSCAPE LEGEND

SYMBOL	QTY	BOTANICAL NAME COMMON NAME	SIZE	REMARKS
	18	ACER RUBRUM 'RED SUNSET' RED SUNSET MAPLE	2 1/2" TO 3" CAL.	B&B
	8	CRATAEGUS VIRIDIS 'WINTER KING' WINTER KING HAWTHORN	2" TO 2 1/2" CAL.	B&B
	14	PINUS STROBUS WHITE PINE	6' TO 7'	B&B
	2	PICEA PUNGENS BLUE SPRUCE	7' TO 8'	B&B
	9	PSEUDOTSUGA MENZIESII DOUGLAS FIR	6' TO 7'	B&B
	17	PICEA GLAUCA WHITE SPRUCE	5' TO 6'	B&B
	5	QUERCUS PALUSTRIS PIN OAK	2" TO 2 1/2" CAL.	B&B
	11	CERCIS CANADENSIS EASTERN REDBUD	7' TO 8'	B&B
	3	CORNUS FLORIDA FLOWERING DOGWOOD	7' TO 8'	B&B
	29	THUJA P. 'ATROVIRENS' ATROVIRENS GIANT ARBORVITAE	6' TO 7'	B&B
	61	VIBURNUM TRILOBUM AMERICAN CRANBERRY BUSH	4' TO 5'	B&B
	32	JUNIPERUS V. 'EMERALD SENTINAL' EMERALD SENTINEL JUNIPER	4' TO 5'	B&B
	23	THUJA O. 'SMARAGD' EMERALD GREEN ARBORVITAE	4' TO 5'	B&B
F	16	FOTHERGILLA MAJOR 'MOUNT AIRY' MOUNT AIRY FOTHERGILLA	18" TO 24"	CONT.
JCS	45	JUNIPERUS C. 'SEAGREEN' SEAGREEN JUNIPER	18" TO 24"	CONT.

Use Internet to Learn About Plants

Synonym: Fothergilla gardenia

Common name: Dwarf witch-alder

Flowers: White (Spring)

Size: 3-4 ft.

Light: Best fall color when planted in full sun.

The foliage is distinctive and attractive throughout the season, and turns bright orange-red by mid-November. Every year in late April, the first sight of its little moppy flowers comes as a welcome surprise.

Understanding How Plants Will Grow

- Growth Characteristics
- Spacing
- Planting Conditions
- Planting Pattern

Cul-de-sac Plantings

- Salt tolerant
- Draught Tolerant
- Maintenance Consideration
- Safety

Retaining Walls:

Field Constructed and Designed

Screens

- Dumpsters
- Commercial/ residential mutual boundaries
- Outdoor storage
- Electrical Systems
- “Undesirable neighbors”

Lighting the Pros and Cons

- Safety
- Advertisement
- Character

verses

- Glare
- Night Sky
- Wildlife Interference

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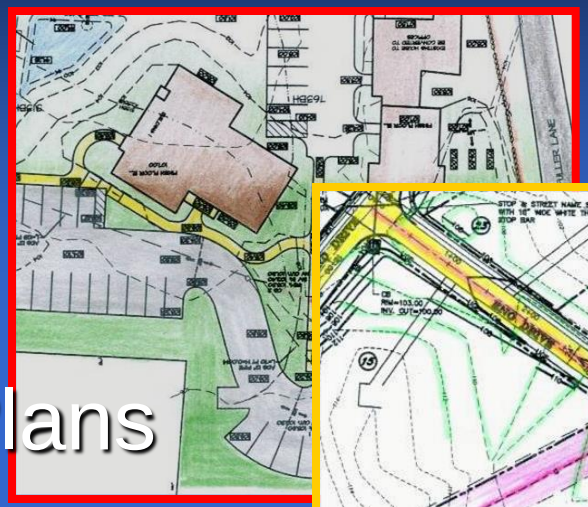
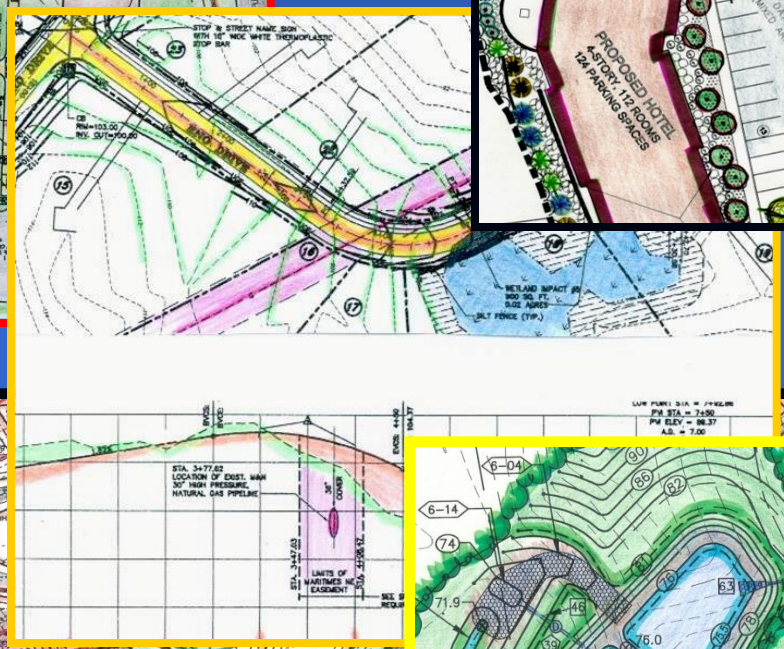
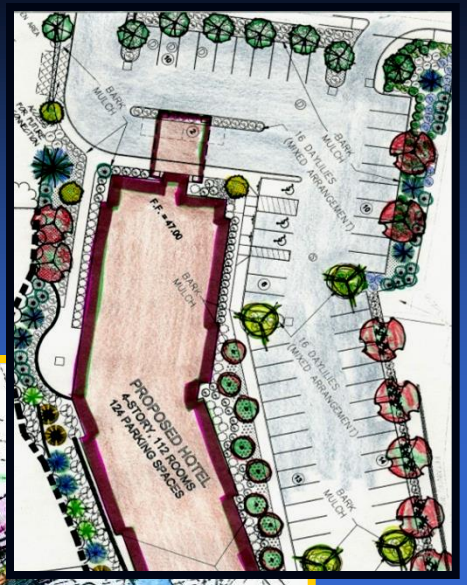
(Ask questions, demand answers.)

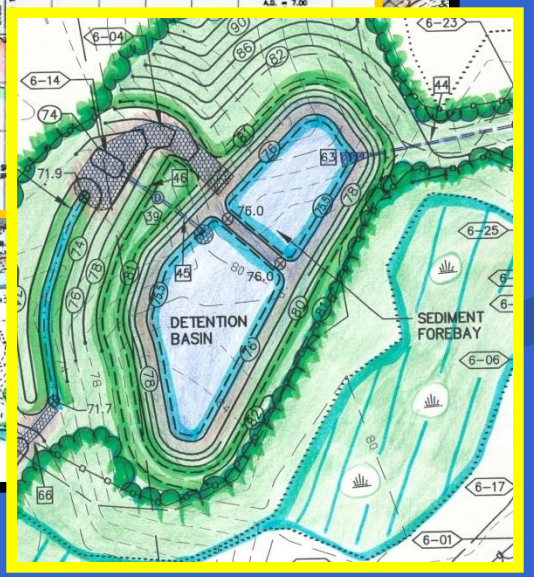
Types of Plans

- Locus Plans
- Site Plans
- Subdivision Plans
- Road Profiles
- Utility Plans
- Grading and Drainage Plans
- Landscape Plans









Expertise Needed in Reading Plans

- Surveying
- Civil Engineering
- Traffic Analysis
- Drainage & Erosion Control
- Wetland Science
- Landscape Architecture
- Lighting

Recognize Red Flags – Analyze Facts, Listen to Your Intuition, Ask Questions !!!

Example: Slope Issues, Erosion & Safety Concerns

1. Road slopes are > 5% -7%
2. Driveways >10% can be hazardous in winter conditions.
3. Swales or ditches > 5% will tend to erode unless erosion control methods are used.

Good Luck and Remember the 5 "Musts" in Plan Reading

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